Terms of Reference
for the
OSEWG Surface Science Scenario Working Group

1.0 Background

NASA's Mission Directorates are working together to accomplish the U.S. Space Exploration Policy, ensuring the largest return on investments as possible. To facilitate the integration of the Agency's planning activities associated with the lunar campaign, the Outpost Science and Exploration Working Group (OSEWG) was chartered jointly by ESMD and SMD in FY2007 to coordinate and guide integrated outpost-related science and exploration planning. The Surface Science Scenario Working Group (SSSWG) is formed to drive the integrated development and optimization of Lunar Surface Scenarios to advance jointly the goals of science and exploration.

2.0 Objectives

The objectives of the OSEWG SSSWG are to:

- Construct Campaign-level (multi-mission) Science Scenarios, Lunar Surface Science Scenarios for single missions, and Design Reference Science Investigations that highlight scientific goals and objectives for examination by the appropriate teams for planning the lunar surface missions, campaigns, and architectures

- Use analysis of selected surface scenarios to drive concepts of operations and requirements for the Constellation program and appropriate projects (e.g., Altair, EVA, and Surface Systems Projects) or in SMD Programs (e.g., LASER, LSSO, MMAMA, ASTEP) or missions (e.g., LADEE, ILN), and see that these requirements are incorporated in the appropriate requirements documents

- Use analysis of selected surface scenarios to drive planning for analog studies

- Engage the science and exploration communities (through LEAG, CAPTEM, and other forums) and the NAC in the discussion of surface scenarios, including responding to NAC actions with respect to surface scenarios.

The SSSWG will provide scenarios of expected typical operation, which will inform and iteratively refine the expected baseline use of the architecture and systems. The SSSWG will also provide scenarios that will bound assumptions and unknowns. It is expected that this scenario development can significantly aid in definition of baseline and bounding concepts of operations, which will inform requirements development. This effort will build upon current inputs from the science community, such as the recommendations from the NAC Workshop on Science Associated with the Lunar Exploration Architecture and the NRC Scientific Context for Exploration of the Moon.

3.0 Activities

This Terms of Reference (TOR) summarizes the scope, membership, responsibilities, products, and schedule for the performance of the Surface Scenario Working Group. A

5-year SSWG Implementation Plan will describe each element in greater detail and will be updated each year to provide more detailed plans and ensure the plan remains aligned with the Agency's goals and priorities.

The SSWG will develop a detailed set of surface science and exploration scenarios that will be optimized to jointly advance science and exploration. Scenario analysis team planning will include the identification of the study team leads and team members. The analyses will employ common ground rules, assumptions and analytical methods to ensure comparable results. The analysis plan will also provide the criteria against which to judge "goodness" and improvability of the scenarios, such as mission benefits and objectives accomplished, mission and operational concepts with associated performance metrics, potential science and exploration system and operational requirements, associated capability and technology developments.

4.0 Key Interdependencies

Through the OSEWG, the SSSWG will engage the science and exploration communities in this surface scenario activity. It is important to facilitate science community input into scenario optimization and selection.

Optimized scenarios will be provided to the appropriate programs for concept of operations development and identification of impacts to requirements. It is expected that the scenarios will provide boundaries for development of the architecture and systems, as well as provide cases of expected typical (day-in-the-life/week-in-the-life) operation. Examples of groups and programs for whom scenarios will be provided include but are not limited to:

- The Constellation Lunar (CxAT team) and its associate formal and informal working groups, subgroups, and project teams
- SOMD and ESMD teams working on lunar communications and navigations architectures
- The Lunar Exploration Analysis Group (LEAG), the Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM), the Mars Exploration Program Analysis Group (MEPAG) and any other external study groups wishing to use reference scenarios in relevant studies
- Other OSEWG subgroups, such as the Analogues Working Group (AWG) and the Lunar Data Working Group (LDWG)
- The broader science and technical communities through peer-reviewed journal articles

5.0 Scope

The scope includes OSEWG-sponsored studies with an initial focus on lunar surface scenarios, to be extended to Mars surface scenarios when and where appropriate to ensure Moon/Mars program continuity. Studies and workshops conducted by the SSSWG will consider potential partnerships within the agency to minimize redundant effort within NASA and avoid unnecessary costs associated with developing concepts of operations and science goals on planetary surfaces.

The scope of the effort will also include the incorporation of strategic communication requirements into the planning to ensure NASA will be able to communicate the results to outside entities in the most effective manner.

6.0 Membership
This working group includes approximately five NASA civil servants from the NASA Centers and is co-chaired by ESMD and SMD. The co-chairs are appointed by the OSEWG leadership. SSSWG members are expected to participate in meetings and provide inputs into the creation of the SSSWG implementation plan.

Note that external science community will be engaged through workshops and/or the LEAG (through appropriate channels).

7.0 Deliverables
The SSSWG findings shall be documented in a presentation, narrative report and multimedia. Products will be delivered to the OSEWG and made available on an *ad hoc* basis to external partners.

8.0 Schedule
This TOR covers OSEWG SSSWG activities for the period 2008-2013. Accomplishments and results will be documented on an annual basis and presented to the OSEWG. Initial surface scenarios are expected to be generated by June 2008.

The SSSWG implementation plan will be submitted for OSEWG approval by May 2008 and updated on an annual basis. The SSSWG will provide a status report to the OSEWG at its bi-weekly meetings.

Submitted by:

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Approved by:

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